

XLogic SDI-MADI

Installation and User Guide



XLogic SDI-MADI This is SSL.

Solid State Logic
SOUND || VISION

Important Safety and Installation Instructions

This section contains definitions, warnings, and practical information to ensure a safe working environment.

Please take time to read this section before installing or using this unit. Please do not dispose of these instructions.

- Read these instructions
- Keep these instructions
- Heed all warnings
- Follow all instructions
- Do not use this apparatus near water
- Do not expose this apparatus to rain or moisture.
- Clean only with a dry cloth
- Do not block any ventilation openings. Install with accordance with the manufacturer's instructions.
- No naked flames, such as lighted candles, should be placed on the apparatus.
- Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
- There are no user-adjustments, or user-serviceable items, inside this apparatus. Do not remove the covers of this apparatus; doing so will invalidate your warranty.
- Adjustments or alterations to this apparatus may affect the performance such that safety and/or international compliance standards may no longer be met.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.

Caution

- Hazardous voltages may be present inside this apparatus.
- Do not operate this apparatus with the covers removed.
- To reduce the risk of electric shock, do not perform any servicing other than that contained in these Installation Instructions unless you are qualified to do so. Refer all servicing to qualified service personnel and ensure that all power cords are disconnected when servicing this apparatus.
- Only use attachments/accessories specified by the manufacturer.

Power Safety

- This apparatus is fitted with a universal power supply, approved and certified for operation in this apparatus. There are no user-replaceable fuses.
- An external over-current protection device is required to protect the wiring to this apparatus. This protection device must be installed according to current wiring regulations. In certain countries this function is supplied by use of a fused plug.
- If an extension power cable or adaptor is used, ensure that the total power rating of the power cable and/or adaptor is not exceeded.
- An external disconnect device is required for this apparatus; a

- detachable power cord is a suitable disconnect device.
- The apparatus should be located close enough to an AC outlet so that you can easily grasp the power cord plug at any time.
- This apparatus is a Class I construction and shall be connected to an AC outlet with a protective grounding connection.
- Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- All power cords must be disconnected to isolate this apparatus completely.
- Caution: To reduce the risk of electric shock, plug each power supply cord into separate branch circuits employing separate service grounds
- This equipment is not supplied with a detachable power cord. The device should be connected to a power supply only of the type described in the Installation Guide or as marked on the device. The power cord must be earthed and precautions should be made so that the grounding is not defeated. A mains cord, fitted with an IEC 60320 C13 type socket, appropriate sized conductors and plug to suit local electrical requirements.
- The power supply cord (i.e. conductor, coupler [IEC 60320 C13] and plug combination) must be suitably rated for the apparatus and the country of use (meeting local electrical requirements). A power supply cord with a rating of not less than 125% of current rating is suitable. The minimum rating for the power supply cord at 110 / 230V ac to be 1A.

Installation

- When installing this apparatus, either fix it into a standard 19" rack or place the apparatus on a secure level surface. When this apparatus is rack mounted, fit all rack screws.
- Ensure that no strain is placed on the cables connecting to this apparatus. Ensure also that such cables are not placed where they can be stepped on, pulled or tripped over.
- Do not operate this apparatus whilst it is covered or boxed in any way.

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Important Safety Precautions



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

CAUTION: RISK OF ELECTRIC SHOCK. THIS EQUIPMENT HAS MORE THAN ONE POWER CORD. TO REDUCE THE RISKS OF ELECTRIC SHOCK DISCONNECT BOTH POWER SUPPLY CORDS BEFORE SERVICING



The lightning flash with arrowhead symbol, within equilateral triangle, is intended to alert the user to the presence of un-insulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating instructions and maintenance (servicing) instructions in the literature accompanying the appliance.

Important Safety Information

This apparatus has no mains switch or other user-operated control for disconnecting the AC mains power. The mains plugs or the appliance couplers (IEC sockets) are used as the disconnect devices. Either device must remain readily operable and accessible when the apparatus is installed for use.

This unit includes thermally resettable fuses that are integral to the power supply circuitry, but the unit must always be powered from a supply fitted with an HRC type (High In-Rush Current) fuse with a rating of 1 A.

Conformity and Warranty

This document confirms that products bearing the CE label meet all the requirements in the EMC directive 2004/108/EC and LV directive 2006/95/EC laid down by the Member States Council for adjustment of legal requirements. Furthermore the products comply with the rules and regulations from 30 August 1995 referring to the electromagnetic compatibility of devices. SSL SDI-MADI units bearing the CE label comply with the following harmonised or national standards:

EMC:

BS EN 55103-1 :1997
BS EN 55103-2 :1997

Safety:

BS EN 60950-1:2006 (ed.2) + A11:2009

Insulation:

Class 1



FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Instructions for Disposal of WEEE by Users in the European Union



The symbol shown here is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collection point for recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.

Standards Conformance

Limited Warranty

Warranty claims will only be accepted if the purchased product has been used for its intended purpose. Any purchased product used for an unintended purpose will not be eligible for warranty protection. For all warranty inquiries or claims please address your claim to the dealer that you purchased the product from – or to Solid State Logic if the purchase was directly from Solid State Logic – within a period of two months from the date on which you detected its lack of conformity with the terms of the warranty. **Please include your original proof of purchase when initiating the claim.**

- **Within the EU:** Pursuant to the Solid State Logic Terms and Conditions under European consumer law the purchaser has full statutory warranty rights for two years from the date of delivery of the product. The warranty is valid only in those Member States of the European Union (EU) who have adopted the applicable EU law into their national legislation. The applicable national legislation governing the sale of consumer goods is not affected by this warranty.

- **Outside of the EU:** Outside of the European Union a 12 month warranty from date of purchase is applicable.

Out of Warranty Repairs

In the event of a fault arising after the warranty period has expired the unit should be returned to Solid State Logic either directly or via your local dealer. You will be charged for the time spent on the repair (at Solid State Logic's current repair rate) plus the cost of parts and shipping. Note that no units can be accepted for repair without prior arrangement (see below).

All Returns

- No unit will be accepted for repair by Solid State Logic unless accompanied by a valid RMA (Return Material Authorisation) number, obtainable from Solid State Logic prior to shipping.
- All units should be shipped to Solid State Logic in suitable rigid packaging – Solid State Logic cannot be held responsible for any damage caused by shipping units in other packaging. In such cases Solid State Logic will return the unit in a suitable box, which you will be charged for.
- Do not include the power cable, manual or any other items – Solid State Logic can not guarantee to return them to you.

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As research and development is a continual process, Solid State Logic reserves the right to change the features and specifications described herein without notice or obligation.

Solid State Logic cannot be held responsible for any loss or damage arising directly or indirectly from any error or omission in this manual.

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Introduction

Congratulations on your purchase of this Solid State Logic XLogic SDI-MADI unit. Please be assured that it will provide you with many years of reliable service while delivering the pristine audio quality you expect from any Solid State Logic product.

The SSL SDI-MADI is a cost-effective solution to the problem of connecting audio equipment to the SDI-based infrastructure found in many broadcast facilities today. Occupying only 1U of rack space, the SDI-MADI provides the interface between SDI video bit streams and digital audio. SDI-MADI extracts up to 16 audio channels from each of the unit's four SDI inputs to provide a total of up to 64 audio channels in both MADI (AES10id-2008) and AES3 (AES3-1992) formats. All SDI inputs independently auto-sense between 3G, HD and SD standards and are provided with loop-through connectivity for downstream equipment.

With a comprehensive range of synchronising options and switchable sample rate converters, the SDI-MADI is designed to reliably and seamlessly integrate into any broadcast environment where SDI-embedded audio channels require format conversion.

This manual covers the XLogic SDI-MADI's connections and indications, including its various options for synchronisation and external control. Please keep the manual in a safe place once you have installed the XLogic SDI-MADI unit.

IMPORTANT

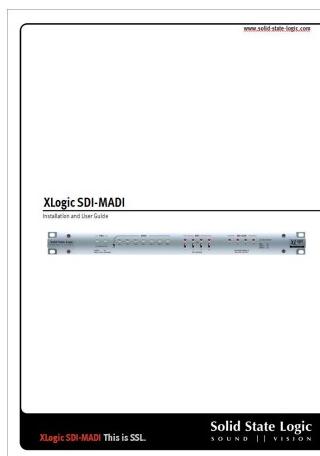
Please register your XLogic SDI-MADI unit on our website. This will ensure that you receive notification of future updates and other important information, and that your guarantee is registered. Registration will also make you eligible for technical support.

The Solid State Logic home page is at: www.solidstatelogic.com

From there you can access our Support page, which includes links to the Product Registration and Download pages. You can also visit the Frequently Asked Questions (FAQ) area for any questions you might have or to contact our Technical Support staff.

Un-pack

Your XLogic SDI-MADI box should contain the following:



User & Installation Guide (this document)



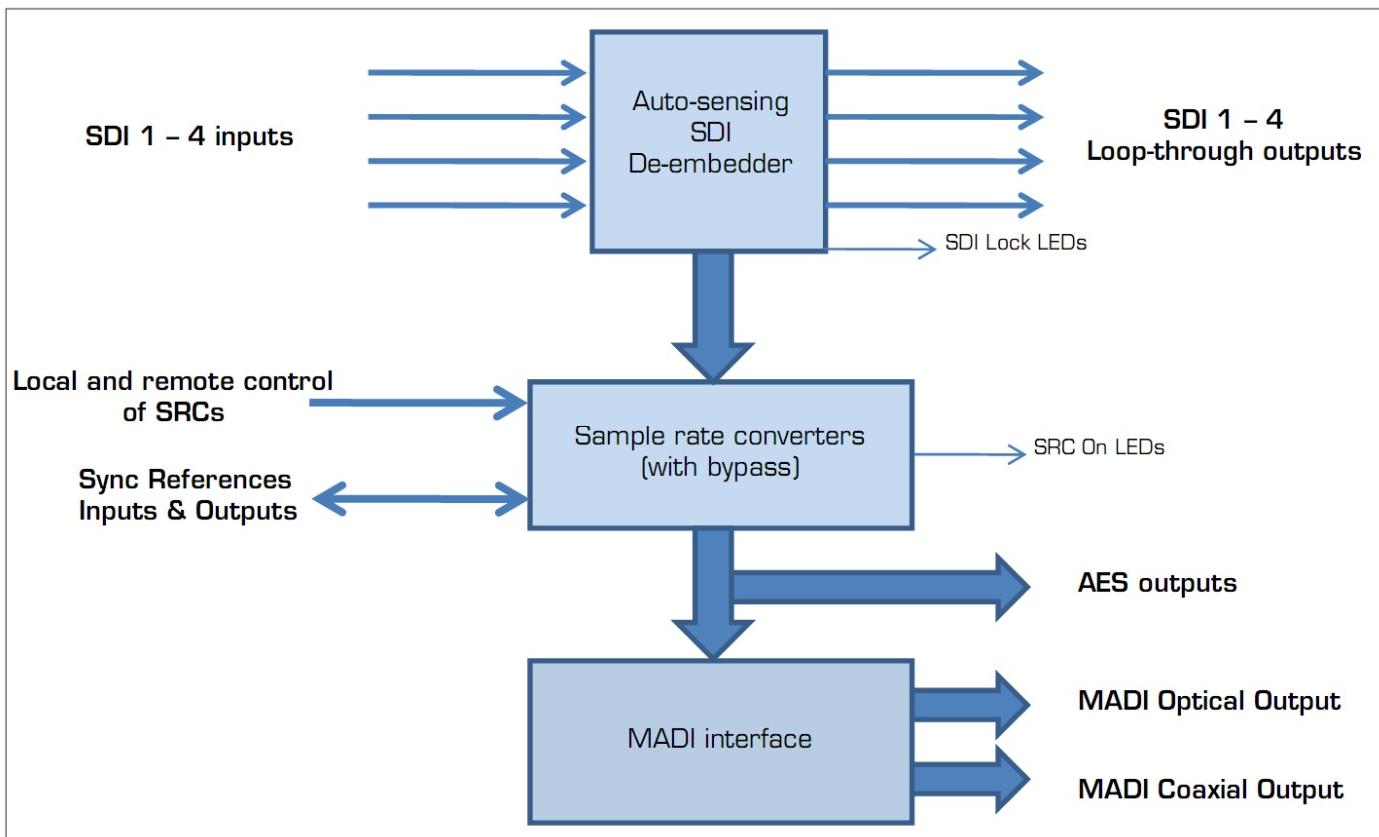
The XLogic SDI-MADI Unit

Key Features



- 4 x SDI inputs on 75Ω BNC connection. 16 audio channels per input
- Auto-detection of SD/HD/3G input format
- Active loop-through of each input to 75Ω BNC output connection
- Full Dolby® E/Dolby® Digital transparency for loop through
- 32 x AES digital audio output via 37 pin D-Sub
- Dual 64 Ch MADI digital audio output via ST Multimode Optical and Coax
- Front Panel LED status indication for PSU, SYNC, SRC and SDI Lock
- Comprehensive sync options (Wordclock, AES, Black and Burst, SDI1 - 4)
- Wordclock and AES sync outputs
- On-board sample rate converters (SRCs), enabled locally or remotely via GPI
- Dual power supplies, with separate IEC mains connectors
- Optional 19" AES Signal Breakout panel providing AES3-id outputs on 32 x BNC connectors (75Ω)

Block Diagram



Specifications

VIDEO INPUTS		SYNCHRONISATION	
Connector/input impedance	4 x BNC sockets, 75 Ω	Sample Rate Conversion	SRC available on all inputs, switchable in banks of 16
Compatible formats	SDI, SD/HD/3G, compliant with SMPTE 259M, 296M, 274M, 292M, 424M or 425M	Sources	(External): SDI1 to 4, AES3, Video black-and-burst, Wordclock
VIDEO OUTPUTS		Video sync input	PAL/NTSC 50/60 Hz (SD)
Connector/output impedance	4 x BNC sockets, 75 Ω	Wordclock input	48 kHz ±50ppm, DC coupled, positive going
Format	Active, re-clocked loop-through of SDI inputs	AES3 input	AES3 input at fs=48kHz
AUDIO INPUTS		Wordclock output	48 kHz nominal
Format	Extracted from SDI video inputs	AES3 output	Digital audio signal compliant with AES3-1992
AES3 AUDIO OUTPUTS		GPIO PORT	
Connector/output impedance	37-way female Dsub, 32 x 75 Ω unbalanced	GPIO port – connector	9-pin female Dsub
Format	Compliant to AES3-1992	Input functions	4 x SRC select (short-to-ground)
Sampling frequency	48 kHz nominal	Output functions	4 x SRC status (open-collector)
MADI AUDIO OUTPUT		POWER SUPPLY	
Connector/output impedance (coaxial)	BNC socket, 75 Ω	Type	2 x independent switch-mode regulated, auto-ranging
Connector (optical)	ST Multimode	Inputs	2 x 90 to 264 V AC, 50/60 Hz
Format	64-channel, compliant with AES10id-2008	Power consumption	16 W
Data rate	125 Mbps ±25ppm	Connectors	2 x IEC with retaining clips
PHYSICAL		Fuse data	Internal fixed resettable (non-user-accessible). Use a 1 A HRC externally-fused supply
Dimensions (w x d x h)	483 x 200 x 44.5 mm (1U)		
Weight	4 kg / 8.8 lbs		
Operating temperature range	0°C to +40°C		
Relative humidity range	70% max, (non-condensing)		

Front Panel Description

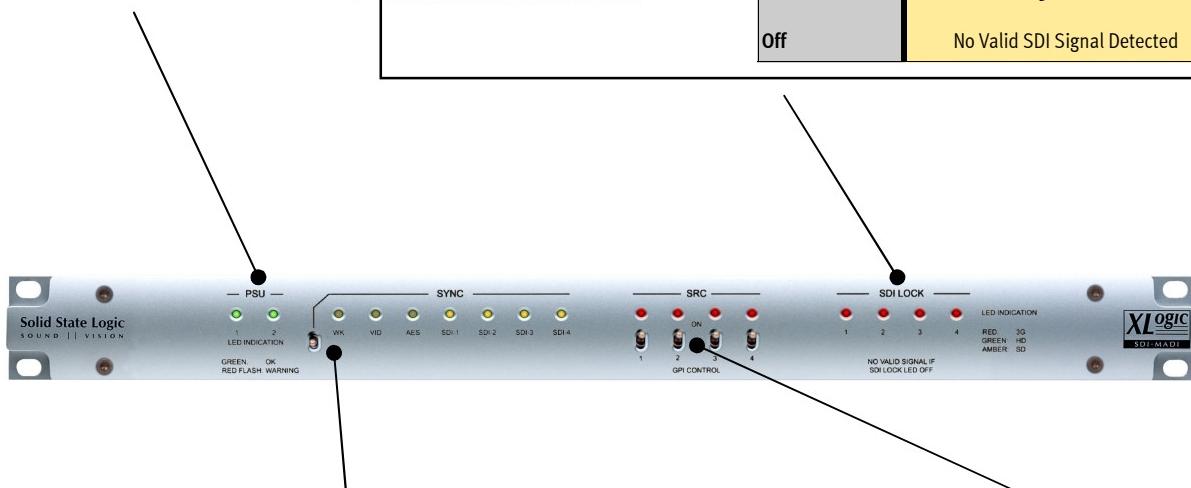
PSU Status

Two bi-colour LEDs confirming the current status of each PSU. The LEDs are green in normal operation and flash red if a PSU fault condition is detected.

SDI Lock LEDs

Four tri-colour LEDs, for SDI inputs 1 to 4. Each illuminates when a valid SDI video signal is detected at its input, and the colour indicates the interface standard in use.

Colour	SDI Format
Yellow	SD-SDI
Green	HD-SDI
Red	3G-SDI
Off	No Valid SDI Signal Detected



Sync Source Selection

A 3-position toggle switch for selecting the audio sync source. The switch's 'down' position is latching, while its 'up' position is momentary. Repeated 'upward' presses on the switch scroll through the possible external sync sources. The adjacent amber LEDs indicate the currently-selected source.

When the LED for the desired source is on, the switch may be placed in the latching 'down' position to prevent inadvertent further changes of sync source.

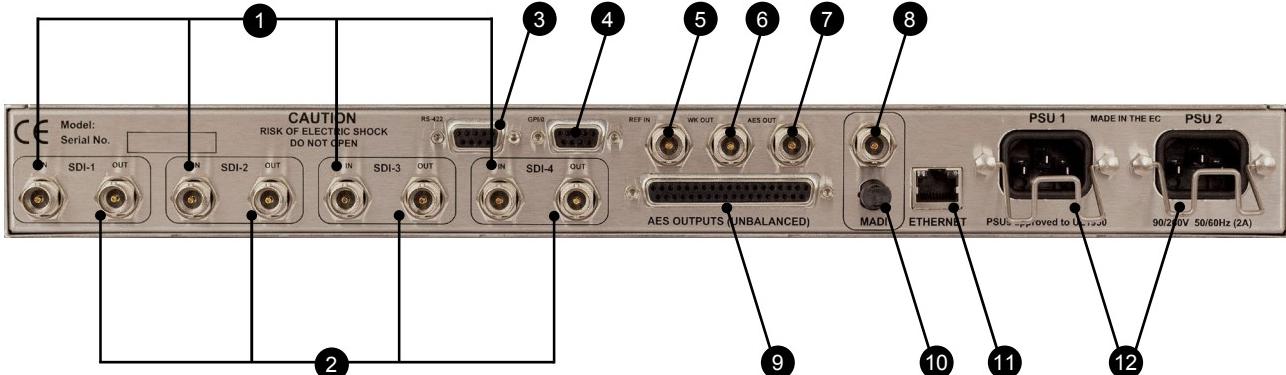
Switch Position	Function
Centre	No Action
Up (Momentary)	Increments Sync Source Selection
Down (Latches)	Locks Sync To Chosen Source

SRC Control

Four 2-position toggle switches controlling the four 16-channel output SRCs. The switch also enables external GPI control of each SRC.

Switch Position	Function
Up	SRC On
Down	SRC Off, but under external GPI control

Rear Panel Description



- ① **SDI video inputs 1 to 4 (4 x BNCs)** – internally illuminated green
- ② **SDI video active loop through outputs 1 to 4 (4 x BNCs)** - internally illuminated red
- ③ **RS-422 port (9-pin female Dsub)**
- ④ **GPI/O port (9-pin female Dsub)**
- ⑤ **Ext. Sync input (BNC)**
- ⑥ **Wordclock out (BNC)**
- ⑦ **AES3 sync out (BNC)**
- ⑧ **Co-axial MADI output (BNC)**
- ⑨ **AES3 outputs (37-way female Dsub)**
- ⑩ **Optical MADI output (ST)**
- ⑪ **Ethernet port (RJ45)**
- ⑫ **AC inputs – 2 x IEC sockets**

Installation

Hardware Considerations

The XLogic SDI-MADI is built in a 1U 19" enclosure. It is intended to be permanently installed in a standard 19" equipment rack. The unit has no internal fans and is cooled by natural convection. There are ventilation grilles in the top, bottom and both sides of the enclosure, and care must be taken to ensure that these are not blocked by cables or other equipment when the unit is installed. Do not install any other items of equipment immediately above or below to the SDI-MADI; the use of 1U blanking panels is recommended.

Power Supply Considerations

The SDI-MADI is fitted with two separate, auto-ranging switch-mode power supplies (PSUs). The operating voltage range is 90 to 264 V AC, 50/60 Hz. The internal power rails are diode-paralleled to the two supplies, and the unit will operate normally if only one PSU is powered or functional. For maximum protection when using both PSUs, the two AC inlet cables should be connected to mains circuits which are as independent of each other as possible. If redundant operation is not required, only one AC supply cable need be connected; either AC inlet may be used.

Fuses And Ratings

Each of the SDI-MADI's PSUs has an internal resettable fuse for PSU protection. These fuses are not accessible to the user. The unit should be powered from a mains supply (supplies) fitted with an external HRC-type fuse (High Inrush Current) rated at 1 A.

Unit Connections

SDI Inputs

The SDI-MADI can simultaneously de-embed the 16 audio channels in each of four separate SD video signals. Four BNC sockets are provided a the rear panel for connecting the SDI inputs. The characteristic impedance is 75Ω . The SDI-MADI is compatible with all SDI formats up to 3G (2.9 Gbps) and auto-detects between them. See the Technical Specifications on page 16 for full list of compatible formats.

Each SDI input has an active "loop through" output to simplify the connection of further equipment. The outputs are fully buffered from the inputs and are re clocked. The SDI bit stream is otherwise unaltered.

AES3 Outputs

The 64 audio channels de-embedded from the four SDI inputs are available as 32 AES-3 digital audio outputs on the rear panel 37-way female Dsub connector. The outputs are 75Ω unbalanced as per AES3-4-2009, Annex D. The table below gives the pinout:

Note:

Each AES3 output carries 2 audio channels, thus the 16 audio channels embedded in each SDI input generate 8 AES3 outputs.

To aid installation, an optional AES Signal Break Out accessory (ASBO) is available from SSL. This consists of a 1U 19" panel with 32 BNC sockets, prewired to a 37-way Dsub plug. This may be mounted at the front or rear of the rack and greatly simplifies wiring.

Pin	Output	SDI Source	Audio Ch's	Pin	Output	SDI Source	Audio Ch's
1	AES 1	SDI 1	Ch's 1 & 2	20	AES 3	SDI 1	Ch's 5 & 6
2	AES 2		Ch's 3 & 4	21	AES 4		Ch's 7 & 8
3	AES 5		Ch's 9 & 10	22	AES 7		Ch's 13 & 14
4	AES 6		Ch's 11 & 12	23	AES 8		Ch's 15 & 16
5	AES 9	SDI 2	Ch's 1 & 2	24	AES 11	SDI 2	Ch's 5 & 6
6	AES 10		Ch's 3 & 4	25	AES 12		Ch's 7 & 8
7	AES 13		Ch's 9 & 10	26	AES 15		Ch's 13 & 14
8	AES 14		Ch's 11 & 12	27	AES 16		Ch's 15 & 16
9	AES 17	SDI 3	Ch's 1 & 2	28	AES 19	SDI 3	Ch's 5 & 6
10	AES 18		Ch's 3 & 4	29	AES 20		Ch's 7 & 8
11	AES 21		Ch's 9 & 10	30	AES 23		Ch's 13 & 14
12	AES 22		Ch's 11 & 12	31	AES 24		Ch's 15 & 16
13	AES 25	SDI 4	Ch's 1 & 2	32	AES 27	SDI 4	Ch's 5 & 6
14	AES 26		Ch's 3 & 4	33	AES 28		Ch's 7 & 8
15	AES 29		Ch's 9 & 10	34	AES 31		Ch's 13 & 14
16	AES 30		Ch's 11 & 12	35	AES 32		Ch's 15 & 16
17	n/c			36	n/c		
18	n/c			37	Ground		
19	Ground						

Installation

MADI Outputs

The 64 de-embedded audio channels are also available as MADI (Multichannel Audio Digital Interface), in both co-axial and optical formats. The MADI bit stream contains all 16 channels from all four SDI inputs. The channel numbering within the MADI bit stream is one-to-one, i.e., Channel 1 of SDI 1 becomes MADI Channel 1, Channel 2 of SDI 1 becomes MADI Channel 2, and so on for the remainder of SDI 1's audio channels. Then Channel 1 of SDI 2 becomes MADI Channel 17, and the cycle repeats. If less than four SDI inputs are in use, the MADI bit stream time slots corresponding to the unused inputs will simply contain all zeroes.

The co-axial MADI output is on a BNC socket, and is compliant with AES10id-2008. The characteristic impedance is 75Ω , at a nominal data rate of 125Mbps. Transmission distances up to 50 m are generally achievable.

The same bit stream is available in optical format on an ST type connector, allowing the MADI output signal to be transmitted by fibre if preferred. Recommended fibre types are 62.5/125 μm or 50/125 μm , multimode. Transmission distances of at least 1000 m are achievable.

SDI Input	MADI Channels
SDI 1	1 to 16
SDI 2	17 to 32
SDI 3	33 to 48
SDI 4	49 to 64

Redundant MADI connection

Using an **SSL MADI Opti-Coax** unit the copper coaxial MADI signal can be converted to a parallel optical signal for a redundant optical connection (or vice versa for a redundant copper connection)

RS-422 Port

The rear panel includes an RS-422 port on a 9-pin female Dsub connector. This connector has no function at this time.

GPIO Port

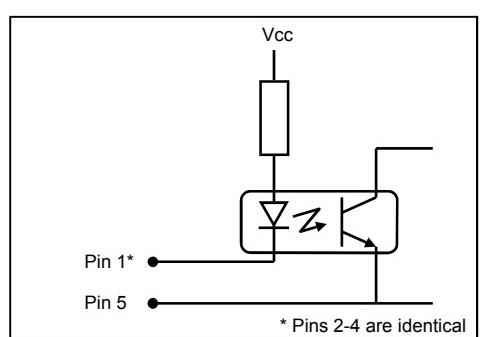
A GPIO (General-Purpose Input-Output) port is available at the rear panel in the form of a 9-pin female Dsub connector. This has four inputs and four outputs, and allows the SDI-MADI's four output SRCs (Sample Rate Converters) to be enabled from external control equipment by contact closure. Tallys confirming the SRC status are also available on this connector.

Pinout is as follows:

GPIO Port Pin	Function
1	GPI 1
2	GPI 2
3	GPI 3
4	GPI 4
5	Ground
6	Tally 1
7	Tally 2
8	Tally 3
9	Tally 4

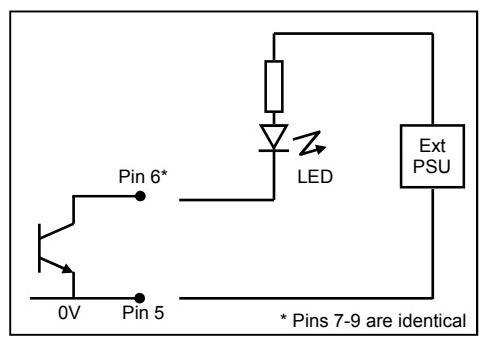
GPI Wiring

The GPI inputs are opto-isolated internally, and activate when the pin is connected to 0 V. (i.e. connect pins 1-4 to pin 5 to activate).



Tally Wiring

The tally outputs are open-collector type, with transistors rated to 24 V. The tallies will typically be used to drive LEDs; connect the cathode of the LED to the tally output and the anode, via a suitable resistor, to an external DC voltage of not more than +24 V. The 0 V reference of the external DC voltage should be connected to pin 5.



ETHERNET Port

The XLogic SDI-MADI includes a standard Ethernet port (an RJ45 socket). This connector has no function at this time.

Setting Up and Operation

Sample Rate Converters

The sampling frequency of the audio data embedded in SDI video signals is 48 kHz. This is invariant, and is enshrined in the defining standards for all SDI formats. As with all operations involving digital audio, it will generally be desirable for the audio outputs of the SDI-MADI to be synchronised (in frequency and/or phase) with a master reference clock, which will also synchronise all other digital audio processing in the facility.

To achieve this, the SDI-MADI includes four 16-channel Sample Rate Converters (SRCs), one for each SDI input (see Rear Panel Description on page 8). Each SRC may be switched in or out by a front panel switch (see Front Panel Description on page 7) or by external control via the GPIO port. When each SRC is active, a red LED illuminates, and a tally output voltage is also available at the rear GPIO port. When enabled, the SRCs re-clock the audio data against a new reference, thereby changing the sampling frequency of the data to that of the reference. They also ensure that the word blocks in the data are phase-locked exactly to the reference clock. The SDI-MADI allows the user to select a reference clock source to suit the infrastructure of the facility and the nature of the transfer process.

See following section on "Synchronisation"

GPIO Control

As the SDI-MADI could be installed in a central control room or outside broadcast vehicle using automated system software applications, external control of the SRCs can be achieved via the GPIO port. Simple contact closure (grounding the GPI) enables any or all the SRCs, allowing them to be switched in or out from a remote point. Maximum recommended operating distance is 5 m (though this may be increased by the use of external relays or similar).

Refer to the pinout on page 12 for wiring details.

Synchronisation

The SDI-MADI offers a choice of wordclock synchronisation sources. The selection is made from the front panel, and the array of LEDs confirms the currently-selected source. The selected source is used as reference for all four output SRCs, thus ALL audio outputs, both in AES3 and MADI formats, will be locked to the selected reference. The various clock sources are discussed on the following page.

Synchronisation

Sync To Wordclock

SRC sync to an external wordclock is indicated by illumination of the ‘WK’ front panel LED. The clock source should be connected to the SYNC IN connector (a BNC socket) on the rear panel. Nominal frequency is 48 kHz 50ppm, and clock pulses should be of 5 V amplitude, positive-going.

Sync To Video Black-And-Burst

The SDI-MADI can also synchronise to a standard (SD) 1 V black-and-burst video signal. The video signal should be connected to the SYNC IN connector on the rear panel. The sync input auto-detects NTSC or PAL standard video.

Sync To AES3

An AES3-compliant digital audio source may be used as the clock reference source. The internal 48 kHz wordclock source is phase-locked to the incoming AES3 signal. Any audio data contained in the AES3 word will be ignored. The audio source should be compliant with AES3-4-2009 Annex D for $75\ \Omega$ coaxial transmission and connected to the SYNC IN connector on the rear panel.

Sync To The SDI Inputs

Any of the four SDI inputs may be used to reference the audio outputs. Each two channels of embedded audio in an SDI stream is essentially compatible with an AES3 word format at a sample frequency of 48 kHz and thus this frequency may be extracted and used as the SRC wordclock in the same way as an AES3 sync source. If one or more pairs of audio channels in an SDI signal is carrying Dolby-encoded material, the SRC for that input should be set OFF, and that input should be the sync referenced source.

Use the derived wordclock output as the master sync reference for downstream equipment.

Note: If using this method, it is important to consider how the remaining three SDI sources synchronise in relation to the sync source. If the inputs are asynchronous then they should have their SRCs set to ON. This ensures that the audio content will synchronise to the referenced SDI input.

Note: Passing Dolby-encoded material through sample rate converters will corrupt the Dolby bit stream.

Clock Outputs

A reference clock output is available at the rear panel WK OUT connector in the form of a 48 kHz clock signal, of 5 V amplitude, positive-going, or at the AES OUT connector in the form of an AES3 digital audio signal (“digital silence”). These are derived from whichever synchronisation source is selected.

Frequently Asked Questions

Power:

Q: Can I run SDI-MADI with just one PSU (AC inlet) cable?

A: Yes, although it is always recommended that two AC inlet cables are connected in order to provide a level of redundancy. The two AC inlet cables should be connected to mains circuits which are as independent of each other as possible.

SDI:

Q: How do you select between SDI formats?

A: The XLogic SDI-MADI automatically determines what the incoming SDI format is and configures itself accordingly. Status of each individual SDI input (SD, HD or 3G) is indicated on the front panel.

Synchronisation:

Q: SDI-MADI is not synchronising to wordclock.

A: Ensure that the incoming wordclock is derived from a 75 ohm terminated source, as per the AES-11 standard.

Q: What is the most commonly recommended configuration for synchronisation?

A: The most commonly used and recommended synchronisation method for SDI-MADI is slaving it to wordclock via the Ref In connector. Ensure that wordclock sync has been selected using the front

panel selection switch (WK LED should illuminate) and that all four sample rate converter switches are set to ON.

Q: Can I daisy-chain other devices to SDI-MADI to when synchronising to Wordclock?

A: This is possible by using the wordclock loop-through connector (WK Out). WK Out is a buffered copy of the incoming wordclock.

Q: Can SDI-MADI be used as a master sync generator?

A: In the majority of installations SDI-MADI should not be used as a master sync generator. The only situation that would dictate use as a master clock reference would be when SDI-MADI is synchronised to an incoming SDI source that contains Dolby® bit streams. In this situation the appropriate SDI's Sample Rate Converter (SRC) switch should be set to OFF and all other external audio equipment should be synchronised to the SDI-MADI's wordclock output (WK Out).

Q: Is the wordclock input terminated?

A: Yes, it is internally terminated at 75 ohms.

Sample Rate Converters:

Q: What are the Sample Rate Converters for?

A: In the traditional sense, Sample Rate Converters (SRC) do as they say; convert an incoming or outgoing audio source from one sample rate to another. In the case of SDI-MADI, the SRCs perform two functions:

- a) The sample rate converters compensate for any minor frequency differences between the incoming SDI 48 kHz and the reference 48 kHz, thus locking the audio to the reference 48 kHz.
- b) The sample rate converters are used to phase align the audio content within the independent SDI sources prior to them being combined and transmitted as a MADI stream. Unless synchronising to an SDI source that incorporates Dolby ® encoded material it is important to ensure that all four SRC switches are set to ON. If set to OFF it could be possible for audible clicks to be present on the MADI receiving device. Note: If SDI-MADI detects that phase alignment between incoming SDI streams is significantly out (and that all SCR are set to OFF), SDI-MADI will mute the MADI output.

Q: When should an SRC switch be set to OFF?

A: The only time an SRC switch should be set to OFF is when Dolby ® content is embedded within the SDI stream. If this situation does arise then SDI-MADI synchronisation must be set to reference that specific SDI input. SDI-MADI will then become the sync master reference source. Ensure that other equipment then synchronises to the unit's Wordclock output (WK Out).

Note: only one SRC should be set to OFF at any one time. The possibility of sync issues could arise if the separate SDI sources are not phase aligned.

Q: Can Sample Rate Conversion be applied to the AES outputs?

A: Yes, depending whether the SRCs are set to ON or not. If set to OFF, synchronisation of each AES pair will be as per the specific input SDI source.

Audio Outputs:

Q: Is there an easier way to access the AES outputs than wiring directly to the 37-way Dsub?

A: Yes, SSL also manufacture a 1U AES3-id breakout unit (ASBO) that connects directly to SDI-MADI and provides the 32 unbalanced AES outputs on BNC connectors (75 ohm). Contact your SSL dealer for further information.

Q: Are the audio outputs always available?

A: Yes, de-embedded audio is simultaneously available as 32 x AES3-id, and optical & coaxial MADI.

Q: What fibre optic MADI cable should I use?

Recommended fibre types are 62.5/125 µm or 50/125 µm, multimode. An ST type fibre optic connector is fitted to SDI-MADI.

Q: I have no MADI output?

A: Check that synchronisation is valid. MADI will not be transmitted if synchronisation is invalid.

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